CLAIMS

What is claimed is:

1. (Original) A node incorporating hybrid radio frequency and optical wireless communication links, the node comprising:
   a) at least one laser portion for transmitting data;
   b) at least one radio frequency portion for transmitting data;
   c) a data receiver for receiving data from a data source; and
   d) a controller configured to receive data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion.

2. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 1, wherein the controller is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion and the radio frequency portion.

3. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 2, wherein the controller is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

4. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 1, wherein the controller is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

5. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 1, wherein the laser portion is configured to

both transmit and receive and wherein the radio frequency portion is configured to both transmit and receive.

6. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the laser portion and the radio frequency portion are configured to transmit in multiple channels.

7. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 6, wherein the controller is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

8. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the controller is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion and the radio frequency portion.

9. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the controller is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

10. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the laser portion and the radio frequency portion have transmit and receive strengths, and wherein the controller is configured to monitor the transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths.

11. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the controller includes a plurality of latches and a logic device, wherein the plurality of latches and the logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion.

12. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 11, wherein the laser portion and the radio frequency portion have aggregate transmit and receive strengths, and wherein the controller is configured to monitor the aggregate transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths.

13. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 11, wherein the laser portion and the radio frequency portion are configured to transmit in multiple channels.

14. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 13, wherein the each channel has a transmit and receive strength, and wherein the controller is configured to monitor the transmit and receive strength of each channel, wherein the channels of the data to be transmitted through the laser portion and the radio frequency portion are determined by the controller based on their transmit and receive strengths.

15. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the at least one laser portion and the at least one radio frequency portion are configured to transmit and receive in tandem, whereby the node may be configured to provide a hybrid serial link to permit tailored radio frequency or optical network connections.

16. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 15, wherein the laser portion and the radio frequency portion are configured to transmit and receive in multiple channels.

17. (Original) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 15, wherein an optical reflector is used to deflect transmissions from the laser portion in order to work around fixed objects in the environment, whereby the node may be used to extend a network and the laser portion can maintain communication without the need for a strict line-of-site connection.

18. (Original) A network incorporating hybrid radio frequency and optical wireless communication links, said network comprising a plurality of nodes, each node including:

a) at least one laser portion for transmitting data;
b) at least one radio frequency portion for transmitting data;
c) a data receiver for receiving data from a data source; and
d) a controller configured to receive data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion.

19. (Original) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein the controller of each node is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion or the radio frequency portion.

20. (Original) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 19, wherein the controller of each node is configured to receive environmental information, and wherein the portions of the data

to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

21. (Original) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein the controller is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

22. (Original) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein the laser portion and the radio frequency portion of each node have transmit and receive strengths, and wherein the controller is configured to monitor the transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths.

23. (Original) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein the laser portion and the radio frequency portion of each node are configured to transmit in multiple channels.

24. (Original) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein the at least one laser portion and the at least one radio frequency portion are configured to transmit and receive in tandem, whereby the node may be configured to provide a hybrid serial link to permit tailored radio frequency or optical network connections.

25. (Original) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein at least a portion of the network is configured with a ring topology.

26. (Original) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 25, wherein at least a portion of the network is configured as a SONET ring.

27. (Original) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 23, wherein at least a portion of the network is configured with a ring topology.

28. (Original) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 27, wherein at least a portion of the network is configured as a SONET ring.

29. (New) A node incorporating hybrid radio frequency and optical wireless communication links, wherein the node is located in an environment, the node comprising:

at least one laser portion for transmitting data;

at least one radio frequency portion for transmitting data;

a data receiver for receiving data from a data source; and

a controller configured to receive environmental information from the environment and data from the data source, wherein the controller is connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion, and wherein the portions of the data to be transmitted are adjusted by the controller based on the environmental information.

30. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 29, wherein the laser portion is configured to both transmit and receive and wherein the radio frequency portion is configured to both transmit and receive.

31. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 30, wherein the laser portion and the radio frequency portion are configured to transmit in multiple channels.

32. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 30, wherein the controller is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion or the radio frequency portion.

33. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 32, wherein the environmental information consists of weather-related data, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the weather-related data.

34. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 32, wherein the laser portion and the radio frequency portion have transmit and receive strengths, and wherein the controller is further configured to monitor the transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the transmit and receive strengths.

35. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 30, wherein the controller includes a plurality of latches and a logic device, wherein the plurality of latches and the logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion.

36. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 35, wherein the laser portion and the radio frequency portion have aggregate transmit and receive strengths, and wherein the

controller is configured to monitor the aggregate transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the aggregate transmit and receive strengths.

37. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 35, wherein the laser portion and the radio frequency portion are configured to transmit in multiple channels.

38. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 37, wherein each channel has a transmit and receive strength, and wherein the controller is configured to monitor the transmit and receive strength of each channel, wherein the channels of the data to be transmitted through the laser portion and the radio frequency portion are determined by the controller based on the transmit and receive strengths.

39. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 30, wherein the at least one laser portion and the at least one radio frequency portion are configured to transmit and receive in tandem, whereby the node may be configured to provide a hybrid serial link to permit tailored radio frequency or optical network connections.

40. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 39, wherein the laser portion and the radio frequency portion are configured to transmit and receive in multiple channels.

41. (New) A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 39, wherein an optical reflector is used to deflect transmissions from the laser portion in order to work around fixed objects in an environment, whereby the node may be used to extend a network and the laser

portion can maintain communication without the need for a strict line-of-site connection.

42. (New) A network incorporating hybrid radio frequency and optical wireless communication links, said network comprising a plurality of nodes, each node comprising:

at least one laser portion for transmitting data;

at least one radio frequency portion for transmitting data;

a data receiver for receiving data from a data source; and

a controller configured to receive environmental information and data from the data source, wherein the controller is connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion, and wherein the portions of the data to be transmitted are adjusted by the controller based on the environmental information.

43. (New) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 42, wherein the controller of each node is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion or the radio frequency portion.

44. (New) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 42, wherein the laser portion and the radio frequency portion of each node have transmit and receive strengths, and wherein the controller is configured to monitor the transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths.

45. (New) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 42, wherein the environmental information

consists of weather-related data, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the weather-related data.

46. (New) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 42, wherein the laser portion and the radio frequency portion of each node are configured to transmit in multiple channels.

47. (New) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 46, wherein at least a portion of the network is configured with a ring topology.

48. (New) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 47, wherein at least a portion of the network is configured as a SONET ring.

49. (New) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 42, wherein the at least one laser portion and the at least one radio frequency portion are configured to transmit and receive in tandem, whereby the node may be configured to provide a hybrid serial link to permit tailored radio frequency or optical network connections.

50. (New) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 42, wherein at least a portion of the network is configured with a ring topology.

51. (New) A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 50, wherein at least a portion of the network is configured as a SONET ring.

Rejections to the Claims:

35 USC§ 103(a)

The Examiner rejected Claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Sato (US Pat. No. 4,904,993), herein referred to as the "Sato patent" in view of Nakamura (US Pat. No. 6,583,908), herein referred to as the "Nakamura patent" or Taglione et al. (US Pat. No. 5,966,225), herein referred to as the "Taglione patent".

Referring to Claim 1, the Examiner stated that the Sato patent teaches a node (referring to 10, Fig. 1) incorporating hybrid radio frequency and optical wireless communication links (referring to col. 2, lines 25-39), the node comprising: an IR portion for transmitting data (referring to 14, Fig. 1); a RF portion for transmitting data (referring to 12, Fig. 1); a data receiver (referring to 16, Fig. 1) for receiving data from a data source (referring to 15, Fig. 1); and a controller (referring to 17, Fig. 1) configured to receive data from a data source and connected with the IR portion and the RF portion to allocate portions of the data to be transmitted through the IR portion and the RF portion (referring to col. 2, lines 30-39, and col. 3, lines 16-19). However, the Examiner further noted that the Sato patent differs from the claimed invention in that the Sato patent does not specifically disclose the IR portion is a laser.

Furthermore, the Examiner noted that the Nakamura patent teaches a computer (referring to 1, Figs. la, and 2) with infrared transmission-reception units (referring to 6a, 11, Fig. 2) to communicate with external devices (referring to col. 3, lines 15-20). The Examiner further stated that the Nakamura patent teaches that the infrared transmission- reception units (referring to 6a, 11, Fig. 2) can use laser light (referring to col. 5, lines 9-16). Likewise, the Examiner stated that the Taglione patent teaches an IR transceiver (referring to 100, Fig. 3 and col. 3, lines 47-56), wherein the IR emitter (referring to 108, Fig. 3) can be a laser diode (referring to col. 3, lines 53-54). Therefore, the Examiner concluded that it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a laser transmitter, as it is taught by either the Nakamura or Taglione patent, for the IR transmission portion in the

transmission system of the Sato patent in order to generate a uniform, narrow, and relatively high power output light.

Regarding Claim 1 rejection over the Sato patent in view of the Nakamura patent, or the Taglione patent

The Applicants sincerely thank the Examiner for acknowledging that the Sato patent does not specifically disclose that the IR portion is a laser portion.

As noted by MPEP 2143.03, to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. The Applicants respectfully submit that the combination of the Sato patent with either the Nakamura or Taglione patent does not teach all of the limitations of Claim 1. Specifically, the Applicants assert that the combination does not teach, disclose, or suggest "a controller configured to received data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion," as is claimed in Claim 1.

The Applicants respectfully note (referring to col. 2, lines 30-34) that the Sato patent clearly transmits data to only either the radio signal sending circuit (referring to 12, Fig. 1) or to the optical signal sending circuit (referring to 14, Fig. 1). A switch (referring to 17, Fig. 1) selects exclusively only one of the sending circuits at one given time. In contrast, the present invention claims, in Claim 1, "a controller configured to ... allocate portions of the data to be transmitted through the laser portion and the radio frequency portion," not only to one or the other sending circuit as is taught by the Sato patent. Furthermore, in contrast with the present invention, the Sato patent never discloses or even suggests transmitting only a portion of the data through the radio signal sending circuit (referring to 12, Fig. 1) or the optical signal sending circuit (referring to 14, Fig. 1).

Furthermore, the Sato patent uses a second switch (referring to 18, Fig. 1) to exclusively supply power to only one of the signal sending circuits at one given time (referring to col.

2, lines 34-39 and referring to col. 4, lines 13-17). The Sato patent states that "a power supply voltage is supplied to any one of the radio signal sending circuit (referring to 12, Fig. 1) or optical signal sending circuit (referring to 14, Fig. 1) by another switch (referring to 18, Fig. 1) in order to operate such circuit." That is, in the Sato patent, only one of the signal sending circuits, the radio or the optical signal sending circuit, is connected to a power supply and is able to transmit signals at any given time, while the other signal sending circuit is "turned off" with no power. Therefore, the Sato patent never teaches, discloses or suggests to "allocate portions of the data to be transmitted through the laser portion and the radio frequency portion," as is claimed in Claim 1, since the Sato patent disables one sending circuit while enabling the other sending circuit.

Further, "If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Also, "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

With regard to substituting a laser transmitter, as taught by the Nakamura or Taglione patent, for the IR transmission portion in the transmission system of the Sato patent, the Applicants respectfully refer the Examiner to the Taglione patent (referring to col. 3, lines 52-57), where it states that a medium band IR emitter is based upon a laser diode, which will be arranged to provide a diffuse, relatively high power (about 500 mW) transmission. The Applicants further refer the Examiner to the last part of Claim 1 of the Sato patent (referring to col. 4, lines 31-36) "whereby, when ... , the user can switch over said switching means to transmit an optical signal to said receiver in order to save consumption of power from said battery power source." Thus, one of the main advantages claimed in the Sato patent (referring to col. 3, lines 34-37, and col. 4, lines 1-5) is that in order to save consumption of power, the Sato patent allows for the

transmission of signals using the optical signals sending circuit (a photo diode) when the electrical power of the transmitter is consumed.

The Applicants respectfully assert that the proposed modification of combining the prior art from the Sato patent, which claims low power consumption during the optical transmission, with the prior art taught by the Nakamura or Taglione patent, which have relatively high power (about 500 mW) transmission by using a laser during the optical transmission, would change the principle of operation of the Sato patent. Thus, it would not have been apparent to any one skilled in the art to use the prior art in this manner, since the combination of the prior art references would render the Sato patent unsatisfactory for its intended purpose.

Further, the Applicants submit that the prior art references do not contain any suggestion or motivation express or implied that they be combined. Therefore, the teachings of the references are not sufficient to render Claim 1 *prima facie* obvious. MPEP 706.02(j) states that the teaching or suggestion to make the claimed combination ... must be found in the prior art and not based on applicant's own disclosure. *In re Vaeck,*947 F.2d 488 (Fed. Cir. 1991). Applicants are unaware where in either the Sato, Nakamura or Taglione patent it is taught, disclosed or suggested that the IR portion of the Sato patent should be uniform, narrow and relatively power output light, thus suggesting the motivation to replace the IR portion of the Sato patent with a laser . The Applicants respectfully request that the Examiner indicate where in the prior art he is finding the motivation to combine the references.

For the foregoing reasons the Applicants respectfully believe that Claim 1, as written, is patentable over the combination of prior art references and respectfully requests that this rejection of Claim 1 under 35 USC §103(a) be withdrawn.

35 USC§ 103(a)

The Examiner rejected Claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Kavehrad (Canadian Electrical & Computer Engineering Journal, Vol. 16, No: 1, PP. 13-18), herein referred to as the "Kavahrad article."

In particular, the Examiner stated, regarding Claim 1, that the Kavehrad article teaches a node (referring to Fig. 1) incorporating hybrid radio frequency and optical wireless communication links (referring to page 14, first column), the node comprising: a laser portion (referring to laser in Fig. I) for transmitting data (referring to IF_1, IF_2, ..., Fig. 1); a RF portion for transmitting data (referring to page 14, first column, and the RF portion in Fig. 1); a data receiver for receiving data from a data source, where the Examiner further noted that "twelve IF channels are received and frequency division multiplexed" (referring to Fig. 1).

In addition, the Examiner stated that the system disclosed in the Kavehrad article differs from the claimed invention in that the Kavehrad article does not specifically disclose a controller configured to receive data from a data source and connected with the laser portion and the RF portion to allocate portions of the data to be transmitted through the laser portion and the RF portion. The Examiner further stated that the Kavehrad article teaches a hybrid radio architecture (referring to Fig. 1), which consists of a number of digital point to point microwave radio channels (referring to IF_1, IF_2, ..., Fig. 1), with a parallel atmospheric optical link protecting all of them against frequency selective fading and RF interference (referring to abstract, introduction, and page 14 first column). Furthermore, the Examiner stated that the Kavehrad article teaches the radio channels need to be operational when the optical channel is down due to weather related problems (referring to page 16, second column). Then, the Examiner concluded that it would have been obvious that such system incorporates a control or a switch to change the optical link to RF link or vise versa, and that it would have been obvious to an artisan at the time of invention that a hybrid data transmission system, such as the one of the Kavehrad article, can control or route the transmission of data signals over radio link or optical link, in order to prevent against fading and interference.

Regarding Claim 1 rejection over the Kavehrad article

The Applicants sincerely thank the Examiner for acknowledging that "the Kavehrad article differs from the claimed invention in that the Kavehrad article does not specifically disclose a controller configured to receive data from a data source and connected with the laser portion and the RF portion to allocate portions of the data to be transmitted through the laser portion and the RF portion."

As noted by MPEP 2143.03 to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. The Applicants respectfully submit that the Kavehrad article does not teach all of the claim limitations of Claim 1. Specifically, the Applicants assert that the Kavehrad article does not teach, disclose, or suggest "a controller configured to received data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion," as is claimed in Claim 1.

With regard to the Examiner's conclusion that "it would have been obvious that such system incorporates a control or a switch to change the optical link to RF link or vise versa," the Applicants respectfully note (referring to abstract) that the Kavehrad article clearly transmits data simultaneously to a number of digital point-to-point microwave radio channels and to a parallel atmospheric optical link, where the parallel optical link protects the radio channels against frequency-selective fading and RF interference. Furthermore, the Kavehrad article states (referring to page 14 col. 1, lines 12-17) that the signals received over the radio route are diversity combined with the signals received from the optical channel.

In addition, the Applicants respectfully refer the Examiner to Figure 1 and Figure 2 of the Kavehrad article, where it is clearly illustrated that the optical link (light) and the RF link (radio) transmit the data signals simultaneously in parallel with each other. Once the transmitted optical signals and the transmitted RF signals arrive at the receiver side, the

transmitted optical signals (referring to Δ_2, Fig. 2) are combined with the transmitted RF signals (referring to Δ_1, Fig. 2) by using a "diversity combiner" (referring to Fig. 1 and Fig. 2), and the outcomes of the "combiner" are delivered to the receivers (referring to page 14, col. 1, lines 14-17) as the final received signals. In comparison, the present invention claims in Claim 1 "a controller configured to receive data from a data source and ... allocate portions of the data to be transmitted through the laser portion and the radio frequency portion," so the controller allocates prior to transmission which portion of the data is to be transmitted, in contrast with the Kavehrad article where all the data has to be transmitted simultaneously through both the optical link and the RF link. Furthermore, in contrast with the present invention, the Kavehrad article never discloses or even suggests transmitting only "a portion" of the data through the radio signal sending circuit or the optical signal sending circuit.

Therefore, the Applicants submit that the Kavahrad article, in combination with the knowledge of one skilled in the art, does not teach, disclose or suggest all of the claim limitations of Claim 1.

Further, "[i]f the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Also, "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Therefore, the Applicants respectfully note that the proposed modification of incorporating a control or a switch to change the optical link to RF link or vise versa, in order to control or route the transmission of data signals over radio link or optical link, would change the principle of operation of the invention disclosed in the Kavehrad article, since the Kavehrad article relies on the diversity combination of the radio signals with the optical signals in order to prevent against fading and interference. Thus, it would

not have been apparent to any one skilled in the art to use the prior art in this manner, since the proposed modification of the prior art would change the principle of operation of the Kavehrad article being modified and would render the Kavehrad article unsatisfactory for its intended purpose.

In addition, it would not have been apparent to any one skilled in the art to use the prior art in this manner, since the prior art references do not contain any suggestion or motivation express or implied that it be modified to use a controller to allocate a portion of the data to be transmitted. Therefore, the teachings of the references are not sufficient to render Claim 1 *prima facie* obvious. The Applicants respectfully request that the Examiner indicate where in the Kavehrad article he is finding the motivation to modify the reference to incorporate a control or a switch to change the optical link to RF link or vise versa.

For the foregoing reasons the Applicants submit that Claim 1, as written, is patentable over the Kavehrad article and respectfully requests that this rejection of Claim 1 under 35 USC §103(a) be withdrawn.

35 USC§ 103(a)

The Examiner rejected Claims 2-4 under 35 U.S.C. 103(a) as being unpatentable over Kavehrad (Canadian Electrical & Computer Engineering Journal, Vol. 16, No: 1, PP. 13-18), herein referred to as the "Kavehard article," in view of Chen (US Patent No: 5,946,120), herein referred to as the "Chen patent," or Zavrel (US Patent No: 5,585,953), herein referred to as the "Zavrel patent."

In particular the Examiner stated, regarding Claims 2-4, that the Kavehrad article differs from the claimed invention in that the Kavehrad article does not specifically teach a controller that can be configured as a binary switch for transmitting data signals through either the laser portion or the RF portion based on environmental information. However, the Examiner further stated that it would have been obvious that a system, such as the one of the Kavehrad article, incorporates a controller or a switch in order to change the

optical link to RF link, or vise versa. Furthermore, the Examiner stated that the Chen patent teaches a control unit (referring to 20, Fig. 1) that can control the transmission of data signals (referring to col. 3, lines 55-64, col. 4, lines 22-26) by a RF transmitter (referring to 16, fig. 1) or an IR transmitter (referring to 18, fig. I). The Examiner further stated that likewise, the Zavrel patent teaches a control unit (referring to 16, Fig. I) and a switch (referring to 18, 20, Fig. 1) for transmitting data signals (referring to col. 2, lines 8-11) by a RF transmitter (referring to 12, Fig. I) or an IR transmitter (referring to 24, Fig. 1). Therefore, the Examiner concluded that it would have been obvious to an artisan at the time of invention to incorporate a control unit such as the one of the Chen or Zavrel patent for the hybrid data transmission system of the Kavehrad article to control and switch the routing of data signals over radio link or optical link in order to prevent against fading and interference.

Regarding Claims 2-4 rejection over the Kavehrad article in view of the Chen patent, or the Zavrel patent

Regarding the Examiner's conclusion that "it would have been obvious to an artisan at the time of invention to incorporate a control unit such as the one of the Chen or Zavrel patent for the hybrid data transmission system of the Kavehrad article to control and switch the routing of data signals over radio link or optical link," the Applicants respectfully refer the Examiner to the comments above regarding Claim 1. As the Kavehrad article, in combination with the knowledge of one skilled in the art, does not teach, disclose or suggest all of the claim limitations of Claim 1, the Applicants submit that these Claims 2, 3 and 4, which depend therefrom, are also allowable.

Further, "[i]f the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Also, "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Therefore, the Applicants respectfully note that trying to combine the prior art of the Kavehrad article with the Chen or Zavrel patent, would result in a nullification of the Kavehrad article's attempts to prevent the fading and interference of transmitted data signals by relying on the diversity combination of the transmitted radio signals with the transmitted optical signals, which need to be transmitted simultaneously in parallel with each other in order to be able to combine the received diverse signals in the receivers end.

The Applicants respectfully conclude that the proposed modification of combining the prior art from the Kavehrad article, which requires the simultaneous transmission of the data signals over the optical link and the RF link, with the prior art from the Chen patent or the prior art from the Zavrel patent in order to control and switch the routing of the data signals over either the radio link or the optical link, would render the prior art from the Kavehrad article unsatisfactory for its individual intended purposes and would change the principle of operation of the Kavehrad article. Thus it would not have been apparent to any one skilled in the art to use the prior art in this manner, since the combination of the prior art references would render the Kavehrad article unsatisfactory for its intended purpose.

Further, the Applicants submit that the prior art references do not contain any suggestion or motivation express or implied that they be combined. Therefore, the teachings of the references are not sufficient to render Claim 1 *prima facie* obvious. MPEP 706.02(j) states that the teaching or suggestion to make the claimed combination ... must be found in the prior art and not based on applicant's own disclosure. *In re Vaeck,*947 F.2d 488 (Fed. Cir. 1991). Applicants are unaware where in either the Kavehrad article, the Chen or Zavrel patent it is taught, disclosed or suggested to incorporate a control unit such as the one of the Chen or Zavrel patent for the hybrid data transmission system of the Kavehrad article, thus suggesting the motivation to control and switch the routing of data signals over radio link or optical link. Therefore, the teachings of the references are not sufficient to render Claims 2, 3, and 4 *prima facie* obvious. The Applicants respectfully

request that the Examiner indicate where in the prior art he is finding the motivation to combine the references.

For the foregoing reasons the Applicants respectfully request that these rejections of Claims 2, 3, and 4 under 35 USC §103(a) be withdrawn.

35 USC§ 103(a)

The Examiner rejected Claims 1-2, 5, and 8 under 35 U.S.C. § 103(a) as being unpatentable over Watson (WO 00108783), herein referred to as the "Watson publication," in view of Nakamura (US Patent No: 6,583,908), herein referred to as the "Nakamura patent," or Taglione et al. (US Patent No: 5,966,225), herein referred to as the "Taglione patent."

In particular, the Examiner stated, regarding Claim 1, that the Watson publication teaches a node (referring to 46, Fig. 5) incorporating hybrid radio frequency and optical wireless communication links (referring to page 5, lines 16-18), the node comprising: an IR portion for transmitting data (referring to 18, 20, Fig. 5); at least one RF portion for transmitting data (referring to 28, 30, Fig. 5); a data receiver (referring to 14, 54, Fig. 5) for receiving data from a data source (referring to 36, Fig. 5); and a controller (referring to 14, Fig. 5) configured to receive data from a data source and connected with the IR portion (referring to 18, Fig. 5) and the RF portion (referring to 28, Fig. 5) to allocate portions of the data to be transmitted through the IR portion and the RF portion (referring to page 9, lines 15-23, page 10, lines 1-6). However, the Examiner further noted that the Watson publication differs from the claimed invention in that the Watson publication does not specifically disclose the IR portion is a laser.

Furthermore, the Examiner noted that the Nakamura patent teaches a computer (referring to 1, Figs. 1a, 2) with infrared transmission-reception units (referring to 6a, 11, Fig. 2) to communicate with external devices (referring to col. 3, lines 15-20). The Examiner also stated that the Nakamura patent further teaches the infrared

transmission-reception units (referring to 6a, 1 I, Fig. 2) can use laser light (referring to col. 5, lines 9-16). Likewise, the Examiner stated that the Taglione patent teaches an IR transceiver (referring to 100, Fig. 3 and col. 3, lines 47-56), wherein the IR emitter (referring to 108, Fig. 3) can be a laser diode (referring to col. 3, lines 53-54). Therefore, the Examiner concluded that it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a laser transmitter, as it is taught by the Nakamura or Taglione patent, for the IR transmission portion in the transmission system of the Watson publication in order to generate a uniform, narrow, and relatively high power output light.

Regarding Claim 1 rejection over the Watson publication in view of the Nakamura patent, or the Taglione patent

The Applicants sincerely thank the Examiner for acknowledging that "the Watson publication differs from the claimed invention in that the Watson publication does not specifically disclose the IR portion is a laser."

As noted by MPEP 2143.03 to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. The Applicants respectfully submit that the combination of the Watson publication with either the Nakamura or Taglione patent does not teach all of the claim limitations of Claim 1. Specifically, the Applicants assert that the combination does not teach, disclose, or suggest "a controller configured to received data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion," as is claimed in Claim 1.

The Applicants respectfully note that the Watson publication never discloses or even suggests transmitting only "a portion" of the data through the IR portion for transmitting data or through the RF portion for transmitting data. In contrast, as stated before and repeated here for clarity, the present invention claims in Claim 1 "a controller configured to ... allocate portions of the data to be transmitted through the laser portion and the radio frequency portion." In addition, neither the Nakamura

patent nor the Taglione patent discloses or even suggests transmitting only "a portion" of the data.

Therefore, the Applicants submit that the Watson publication, in combination with the Nakamura or Taglione patent and the knowledge of one skilled in the art, does not teach, disclose or suggest all of the claim limitations of Claim 1.

Further, the Applicants submit that the prior art references do not contain any suggestion or motivation express or implied that they be combined. Therefore, the teachings of the references are not sufficient to render Claim 1 *prima facie* obvious. MPEP 706.02(j) states that the teaching or suggestion to make the claimed combination ... must be found in the prior art and not based on applicant's own disclosure. *In re Vaeck,* 947 F.2d 488 (Fed. Cir. 1991). Applicants are unaware where in either the Watson publication, the Nakamura patent or the Taglione patent it is taught, disclosed or suggested that the IR portion of the Watson publication should be uniform, narrow and relatively high power output light, thus suggesting the motivation to replace the IR portion of the Watson publication with a laser. The Applicants respectfully request that the Examiner indicate where in the prior art he is finding the motivation to combine the references

For the foregoing reasons the Applicants respectfully believe that Claim 1, as written, is patentable over the combination of prior art references and respectfully requests that this rejection of Claim 1 under 35 USC §103(a) be withdrawn.

Regarding Claims 2, 5, and 8 rejection over the Watson publication in view of the Nakamura patent, or the Taglione patent

Claims 2, 5, and 8 are dependent upon Claim 1. Thus, the Applicants respectfully refer the Examiner to the comments above regarding Claim 1. For the reasons given above, the Applicants submit that Claim 1 is patentable over the cited prior art. Therefore, the Applicants submit that Claims 2, 5, and 8 are allowable based at least through their dependence on an allowable base claim.

For the foregoing reasons the Applicants respectfully requests that these rejections of Claims 2, 5, and 8 under 35 USC §103(a) be withdrawn.

35 USC§ 103(a)

The Examiner rejected Claims 1-2, 5-6, 8, 10, and 12-16 under 35 U.S.C. 103(a) as being unpatentable over Zavrel (US Patent No: 5,585,953), herein referred to as the "Zavrel patent," in view of Nakamura (US Patent No: 6,583,908), herein referred to as the "Nakamura patent," or Taglione et al. (US Patent No: 5,966,225), herein referred to as the "Taglione patent."

In particular the Examiner stated, regarding Claim 1, that the Zavrel patent teaches a node (referring to 10, Fig. 1) incorporating hybrid radio frequency and optical wireless communication links (referring to col. 1, lines 50-55), the node comprising: an IR portion for transmitting data (referring to 24, Fig. 1); a RF portion for transmitting data (referring to 12, Fig. 1); a data receiver (referring to 14, 26, Fig. 1) for receiving data from a data source (referring to col. 1, lines 65-67, col. 2, lines 5-8); and a controller (referring to 16, Fig. 1) configured to receive data from a data source (referring to col. 1, lines 64-65) and connected with the IR portion (referring to 24, Fig. 1) and the RF portion (referring to 12, Fig. 1) to allocate portions of the data to be transmitted through the IR portion and the RF portion (referring to col. 2, lines 1-10). However, the Examiner further noted that the Zavrel patent differs from the claimed invention in that the Zavrel patent does not specifically disclose the IR portion is a laser.

The Examiner further stated that the Nakamura patent teaches a computer (referring to 1, Figs. la, 2) with infrared transmission-reception units (referring to 6a, 11, Fig. 2) to communicate with external devices (referring to col. 3, lines 15-20), and that the Nakamura patent further teaches the infrared transmission-reception units (referring to 6a, 11, Fig. 2) can use laser light (referring to col. 5, lines 9-16). Likewise, the Examiner noted that the Taglione patent teaches an IR transceiver (referring to 100, Fig. 3 and col. 3, lines 47-56), wherein the IR emitter (referring to 108, Fig. 3) can be a laser

diode (referring to col. 3, lines 53-54). Therefore, the Examiner concluded that it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a laser transmitter, as it is taught by the Nakamura or Taglione patent, for the IR transmission portion in the transmission system of the Zavrel patent in order to generate a uniform, narrow, and relatively high power output light.

Regarding Claim 1 rejection over the Zavrel patent in view of the Nakamura patent, or the Taglione patent.

The Applicants sincerely thank the Examiner for indicating that "the Zavrel patent differs from the claimed invention in that the Zavrel patent does not specifically disclose the IR portion is a laser."

As noted by MPEP 2143.03, to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. The Applicants respectfully submit that the combination of the Zavrel patent with either the Nakamura or Taglione patent does not teach all of the claim limitations of Claim 1. Specifically, the Applicants assert that the combination does not teach, disclose, or suggest "a controller configured to received data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion," as is claimed in Claim 1.

The Applicants respectfully note that the Zavrel patent clearly transmits data to only either the RF signal sending circuit (referring to 12, Fig. 1) or to the IR signal sending circuit (referring to 24, Fig. 1), wherein a switch (referring to 20, Fig. 1) selects exclusively only one of the sending circuits at one given time. In contrast, as stated before and repeated here for clarity, the present invention claims in Claim 1 "a controller configured to ... allocate portions of the data to be transmitted through the laser portion and the radio frequency portion," not only to one or the other data transmitting circuit. In further contrast with the present invention, the Applicants respectfully note that the Zavrel patent never teaches, discloses or even suggests transmitting only "a portion" of

the data through the IR portion for transmitting data or through the RF portion for transmitting data.

Further, the Applicants submit that the prior art references do not contain any suggestion or motivation express or implied that they be combined. Therefore, the teachings of the references are not sufficient to render Claim 1 *prima facie* obvious. MPEP 706.02(j) states that the teaching or suggestion to make the claimed combination ... must be found in the prior art and not based on applicant's own disclosure. *In re Vaeck,*947 F.2d 488 (Fed. Cir. 1991).Applicants are unaware where in either the Zavrel patent, the Nakamura patent or the Taglione patent it is taught, disclosed or suggested that the IR portion of the Zavrel patent should be uniform, narrow and relatively power output light, thus suggesting the motivation to replace the IR portion of the Zavrel patent with a laser. The Applicants respectfully request that the Examiner indicate where in the prior art he is finding the motivation to combine the references.

For the foregoing reasons the Applicants respectfully believe that Claim 1, as written, is patentable over the combination of prior art references and respectfully requests that this rejection of Claim 1 under 35 USC §103(a) be withdrawn.

Regarding Claims 2, 5, 6, 8, 10, and 12-16 rejection over the Zavrel patent in view of the Nakamura patent, or the Taglione patent.

Claims 2, 5, 6, 8, 10, and 12-16 are dependent upon Claim 1. Thus, the Applicants respectfully refer the Examiner to the comments above regarding Claim 1. For the reasons given above, the Applicants submit that Claim 1 is patentable over the cited prior art. Therefore, the Applicants submit that these Claims 2, 5, 6, 8, 10, 12, 13, 14, 15 and 16 are allowable based at least through their dependence upon an allowable base claim.

For the foregoing reasons the Applicants respectfully request that these rejections of Claims 2, 5, 6, 8, 10, 12, 13, 14, 15 and 16 under 35 USC §103(a) be withdrawn.

35 USC§ 103(a)

The Examiner rejected Claim 11 under 35 U.S.C. 103(a) as being unpatentable over Zavrel (US Patent No: 5,585,953), herein referred to as the "Zavrel patent," in view of Nakamura (US Patent No: 6,583,908), herein referred to as the "Nakamura patent," or Taglione et al. (US Patent No: 5,966,225), herein referred to as the "Taglione patent" and in further view of Vowell et al. (US Patent No: 5,999,295), herein referred to as the "Vowell patent," or Shibuya (US patent No: 6,509,991), herein referred to as the "Shibuya patent."

In particular the Examiner stated that, regarding Claim 11, the modified optical transmission system of the Zavrel, Nakamura, or Taglione patent differs from the claimed invention in that the Zavrel, Nakamura, or Taglione patent do not disclose the controller includes a plurality of latches and a logic device to further provide adjustments levels. However, the Examiner further noted that the Vowell patent teaches an IR transceiver module that includes an IR transmitter and receiver and a communication logic that is coupled to the transceiver to control communication (referring to col. 3, lines 5-8), wherein the communication logic includes state machines, buffers, latches, registers, memories, etc (referring to col. 3, lines 8-10). The Examiner stated that likewise, the Shibuya patent teaches a transmit and receive control unit (referring to 10, Fig. 6) that is comprised of latches (referring to 59, 60, 61, Fig. 6) and logic devices (referring to 62, 63, Fig. 6). Therefore, the Examiner concluded that it would have been obvious to a person of ordinary skill in the art at the time of invention that a controller, such as the one of the Zavrel patent, can include latches and logic devices, as it is taught by the Vowell or Shibuya patent, to provide monitoring and control functions.

Regarding Claim 11 rejection over the Zavrel patent in view of the Nakamura or Taglione patent and in further view of the Vowell or Shibuya patent.

Claim 11 is dependent upon Claim 1. Thus, the Applicants respectfully refer the Examiner to the comments above regarding Claim 1. For the reasons given above, the Applicants submit that Claim 1 is patentable over the cited prior art. Therefore, the

Applicants submit that Claim 11 is patentable over the cited prior art at least through its dependence upon an allowable base claim.

Furthermore, as noted by MPEP 2143.03, to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. The Applicants respectfully submit that the combination of the Zavrel patent with either the Nakamura or Taglione patent and in further view of the Vowell or Shibuya patent does not teach all of the claim limitations of Claim 11. Specifically, the Applicants assert that the combination does not teach, disclose, or suggest "the plurality of latches and the logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion," as is claimed in Claim 11.

The Applicants respectfully note that the Vowell patent (referring to col. 3, lines 7-10) clearly states "the communication logic preferably includes state machines, buffers, ... for receiving, storing and transmitting data." That is, the Vowell patent clearly uses the communication logic, cited by the Examiner, to exclusively receive, store and transmit data. In contrast, the present invention claims in Claim 11 "... the plurality of latches and the logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion;" therefore, the plurality of latches and the logic device not only receive, store and transmit data but also provide adjustment levels. Furthermore, in contrast with the present invention, the Vowell patent never discloses or even suggests generating adjustment levels.

Furthermore, the Applicants respectfully note that the Shibuya patent (referring to col. 3, lines 14-15, and Fig. 6) clearly states that Fig. 6 "is a block diagram of a transmission/reception control circuit." That is, the Shibuya patent clearly uses the control unit in Fig. 6, cited by the Examiner, to exclusively receive and transmit data. In contrast, the present invention claims in Claim 11 "... the plurality of latches and the logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion;" therefore, the plurality of latches and the logic device not only receive, store and transmit data but also

provide adjustment levels. Furthermore, in contrast with the present invention, the Shibuya patent never discloses or even suggests generating adjustment levels.

Further, the Applicants submit that the prior art references do not contain any suggestion or motivation express or implied that they be combined. Therefore, the teachings of the references are not sufficient to render claim 1 *prima facie* obvious. MPEP 706.02(j) states that the teaching or suggestion to make the claimed combination ... must be found in the prior art and not based on applicant's own disclosure. *In re Vaeck,*947 F.2d 488 (Fed. Cir. 1991). Applicants are unaware where in either the Zavrel, Nakamura, Taglione, Vowell, or Shibuya patents it is taught, disclosed or suggested to incorporate a controller, which includes a plurality of latches and logic devices, such as the one of the Vowel or Shibuya patents, for the data controller of the Zavrel patent, thus, suggesting the motivation to control the routing of data signals by using logic devices. The Applicants respectfully request that the Examiner indicate where in the prior art he is finding the motivation to combine the references.

For the foregoing reasons the Applicants respectfully requests that this rejection of Claim 11 under 35 USC §103(a) be withdrawn.

35 USC§ 103(a)

The Examiner rejected Claims 1-2, 5-6, 8, 10, 13, 15-16, 18-19, and 22-24 under 35 U.S.C. 103(a) as being unpatentable over Vollert (German Patent No: DE 44 33 896 CI), herein referred to as the "Vollert patent," in view of Nakamura (US Patent No: 6,583,908), herein referred to as the "Nakamura patent," or Taglione et al. (US Patent No: 5,966,225), herein referred to as the "Taglione patent."

In particular the Examiner stated that, regarding Claims 1 and 18, the Vollert patent teaches a network (referring to K, Fig. 1) incorporating hybrid radio frequency and optical wireless communication links (referring to translation on page 5, second paragraph), the network comprising a plurality of nodes (referring to KE, KEE, UE, Fig. 1) each node including an IR portion (referring to SE-IN, Fig. 1), a RF portion

(referring to SE-FU, Fig. 1), a data receiver (referring to SP, Fig. 1) and a controller (referring to PST, Fig. 1) to receive the data and to allocate portions of data to be transmitted to the IR portion and to the RF portion (referring to translation on page 5, third paragraph). However, the Examiner stated that the Vollert patent differs from the claimed invention in that the Vollert patent does not specifically disclose the IR portion is a laser.

The Examiner further stated that the Nakamura patent teaches a computer (referring to 1, Figs. la, 2) with infrared transmission-reception units (referring to 6a, 11, Fig. 2) to communicate with external devices (referring to col. 3, lines 15-20), and that the Nakamura patent further teaches that the infrared transmission-reception units (referring to 6a, 11, Fig. 2) can use laser light (referring to col. 5, lines 9-16). Likewise, the Examiner noted that the Taglione patent teaches an IR transceiver (referring to 100, Fig. 3 and col. 3, lines 47-56), wherein the IR emitter (referring to 108, Fig. 3) can be a laser diode (referring to col. 3, lines 53-54). Therefore, the Examiner concluded that it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a laser transmitter, as it is taught by the Nakamura or Taglione patent, for the IR transmission portion in the transmission system of the Vollert patent in order to generate a uniform, narrow, and relatively high power output light.

Regarding base Claims 1 and 18 rejection over the Vollert patent in view of the Nakamura or Taglione patent.

The Applicants sincerely thank the Examiner for acknowledging that "the Vollert patent differs from the claimed invention in that the Vollert patent does not specifically disclose the IR portion is a laser."

As noted by MPEP 2143.03, to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. The Applicants respectfully submit that the combination of the Vollert patent with either the Nakamura or Taglione patents does not teach all of the claim limitations of Claims 1 and 18. Specifically, the Applicants assert that the combination does not teach, disclose, or suggest "a controller

configured to received data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion," as is claimed in Claims 1 and 18.

The Applicants respectfully note that the Vollert patent neither discloses or even suggests transmitting only "a portion" of the data through the IR portion for transmitting data or through the RF portion for transmitting data. In contrast, as stated before and repeated here for clarity, the present invention claims in Claims 1 and 18 "a controller configured to ... allocate portions of the data to be transmitted through the laser portion and the radio frequency portion." Furthermore, in contrast with the present invention, the Vollert patent clearly transmits data to only either the radio transmission path or the infrared transmission path as claimed in Claim 1 of the Vollert patent (referring page 6, Claim 1, and page 1, lines 28-32) "... depending on the result of the verification, the exchange of information is directed over the bidirectional infrared transmission path (IUS) or the bidirectional radio transmission path (FUS) ..." Therefore, the Vollert patent never teaches, discloses or suggests to "allocate portions of the data to be transmitted through the laser portion and the radio frequency portion," as is claimed in Claims 1 and 18, since the Vollert patent disables one transmission path while enabling the other transmission path.

Further, "[i]f the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Also, "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

With regard to incorporating a laser transmitter, as it is taught by the Nakamura or Taglione patent, for the IR transmission portion in the transmission system of the Vollert patent, the Applicants respectfully refer the Examiner to the Taglione patent (referring to

col. 3, lines 52-57), where it is stated that a medium band IR emitter is based upon a laser diode, which will be arranged to provide a diffuse, relatively high power (about 500 mW) transmission. The Applicants further refer the Examiner to the Vollert patent (referring to page 3, lines 14-19) "[a] further advantage of the method according to the invention ... the average power consumption in the communication terminals is lower because of the lower transmitting power of the infrared transmission path ... ." Thus, one of the main advantages claimed in the Vollert patent (page 1, Fig. 1 description) is that in order to save consumption of power, the Vollert patent allows for the transmission of signals using only the bidirectional infrared transmission path whenever possible, which has lower power consumption than the radio transmission path, thus limiting the radio transmissions substantially and reducing the average power consumption.

Therefore, the Applicants respectfully conclude that the proposed modification of combining the prior art from the Vollert patent, which claims low power consumption during the infrared transmission, with the prior art taught by the Nakamura or Taglione patents, which have relatively high power (about 500 mW) transmission by using a laser during the infrared transmission, would change the principle of operation of the Vollert patent. Thus, it would not have been apparent to any one skilled in the art to use the prior arts in this manner, since the combination of the prior art references would render the Vollert patent unsatisfactory for its intended purpose.

Further, the Applicants submit that the prior art references do not contain any suggestion or motivation, express or implied, that they be combined. Therefore, the teachings of the references are not sufficient to render Claim 1 *prima facie* obvious. MPEP 706.02(j) states that the teaching or suggestion to make the claimed combination ... must be found in the prior art and not based on applicant's own disclosure. *In re Vaeck,*947 F.2d 488 (Fed. Cir. 1991). Applicants are unaware where in either the Vollert, Nakamura or Taglione patents it is taught, disclosed or suggested that the Infrared portion of the Vollert patent should be uniform, narrow and relatively power output light, thus suggesting the motivation to replace the IR portion of the Vollert patent with a laser. The

Applicants respectfully request that the Examiner indicate where in the prior art he is finding the motivation to combine the references.

For the foregoing reasons the Applicants respectfully believe that Claims 1 and 18, as written, are patentable over the combination of prior art references and respectfully requests that this rejections of Claims 1 and 18 under 35 USC §103(a) be withdrawn.

Regarding Claims 2, 5, 6, 8, 10, 13, 15, 16, 19, 22, 23 and 24 rejection over the Vollert patent in view of the Nakamura, or Taglione patent.

Claims 2, 5, 6, 8, 10, 13, 15 and 16 are dependent upon Claim 1. Thus, the Applicants respectfully refer the Examiner to the comments above regarding Claim 1. For the reasons given above, the Applicants submit that Claim 1 is patentable over the cited prior art. Therefore, the Applicants submit that these Claims 2, 5, 6, 8, 10, 13, 15 and 16 are patentable over the cited prior art at least through their dependence upon an allowable base claim.

Furthermore, dependent Claims 19, 22, 23 and 24 are dependent upon Claim 18. Thus, the Applicants respectfully refer the Examiner to the comments above regarding Claim 18. For the reasons given above, the Applicants submit that Claim 18 is patentable over the cited prior art. Therefore, the Applicants submit that these Claims 2, 5, 6, 8, 10, 13, 15 and 16 are patentable over the cited prior art at least through their dependence upon an allowable base claim.

For the foregoing reasons the Applicants respectfully request that these rejections of Claims 2, 5, 6, 8, 10, 13, 15, 16, 19, 22, 23 and 24 under 35 USC §103(a) be withdrawn.

35 USC§ 103(a)

The Examiner rejected Claims 3-10, 15-16, and 20-21 under 35 U.S.C. 103(a) as being unpatentable over Vollert (German Patent No: DE 44 33 896 CI), herein referred to as the "Vollert patent," in view of Nakamura (US Patent No: 6,583,908), herein referred to as the "Nakamura patent," or Taglione et al. (US Patent No: 5,966,225), herein referred to

as the "Taglione patent" and in further view of Kavehrad (Canadian Electrical & Computer Engineering Journal, Vol. 16, No: 1, PP. 13-18), herein referred to as the "Kavahrad article."

Regarding Claims 3-10, 15-16 and 20-21 rejection over the Vollert patent in view of the Nakamura or Taglione patent and in further view of the Kavehrad article.

Claims 3-10, 15 and 16 are dependent upon Claim 1. Thus, the Applicants respectfully refer the Examiner to the comments above regarding Claim 1. For the reasons given above, the Applicants submit that Claim 1 is patentable over the cited prior art. Therefore, the Applicants submit that these Claims 3-10, 15 and 16 are patentable over the cited prior art at least through their dependence upon an allowable base claim.

Claims 20 and 21 are dependent upon Claim 18. Thus, the Applicants respectfully refer the Examiner to the comments above regarding Claim 18. For the reasons given above, the Applicants submit that Claim 18 is patentable over the cited prior art. Therefore, the Applicants submit that these Claims 20 and 21 are patentable over the cited prior art at least through their dependence upon an allowable base claim.

Furthermore, "if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Also, "if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

The Applicants respectfully note that trying to combine the prior art of the Vollert patent with the Kavehrad article would require that all the data be transmitted simultaneously through both the optical link and the RF link, thus rendering the Vollert patent being modified unsatisfactory for its intended purpose of saving

consumption of power by transmitting signals using only the bidirectional infrared transmission path whenever possible, which has lower power consumption than the radio transmission path.. As previously stated, and repeated here for clarity, the Kavehrad article clearly transmits data simultaneously to a number of digital point-to-point microwave radio channels and to a parallel atmospheric optical link, where the parallel optical link protects the radio channels against frequency-selective fading and RF interference. Furthermore, the Kavehrad article states (referring to page 14 col. 1, lines 12-17) that the signals received over the radio route are diversity combined with the signals received from the optical channel, as clearly illustrated in Figure 1 and Figure 2, where the optical link (light) and the RF link (radio) transmit the data signals simultaneously in parallel with respect to each other. Once the transmitted optical signals and the transmitted RF signals arrive at the receiver side, the transmitted optical signals (referring to Δ_2, Fig. 2) are combined with the transmitted RF signals (referring to Δ_1, Fig. 2) by using a "diversity combiner" (referring to Fig. 1 and Fig. 2), and the outcomes of the "combiner" are delivered to the receivers (referring to page 14, col. 1, lines 14-17) as the final received signals.

In addition, the Vollert patent claims to clearly transmit data to only either the radio transmission path or the infrared transmission path as claimed in Claim 1 of the Vollert patent (referring page 6, Claim 1, and page 1, lines 28-32). Thus, the mode of operation of the Vollert patent is contradictory to the mode of operation of the Kaverhrad article which requires that the signals be simultaneously transmitted through both the optical link (light) and the RF link (radio).

The Applicants respectfully assert that the proposed modification of combining the prior art from the Vollert patent, which claims to transmit through either the infrared path or the radio path at a time, with the prior art taught by the Kaverhrad article, which requires that the optical link (light) and the RF link (radio) transmit the data signals simultaneously in parallel with each other, would change the principle of operation of the Vollert patent. Thus, it would not have been apparent to any one

skilled in the art to use the prior arts in this manner, since the combination of the prior art references would render the Vollert patent unsatisfactory for its intended purpose.

For the foregoing reasons the Applicants respectfully request that these rejections of Claims 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 20 and 21 under 35 USC §103(a) be withdrawn.

35 USC§ 103(a)

The Examiner rejected Claims 11, 12, 13 and 14 under 35 U.S.C. 103(a) as being unpatentable over Vollert (German Patent No: DE 44 33 896 CI), herein referred to as the "Vollert patent," in view of Nakamura (US Patent No: 6,583,908), herein referred to as the "Nakamura patent," or Taglione et al. (US Patent No: 5,966,225), herein referred to as the "Taglione patent" and in further view of Kavehrad (Canadian Electrical & Computer Engineering Journal, Vol. 16, No: 1, PP. 13-18), herein referred to as the "Kavahrad article," and in further view of Vowell (US Patent No: 5,999,295), herein referred to as the "Vowell patent," or Shibuya (US patent No: 6,509,991), herein referred to as the "Shibuya patent."

Regarding Claims 11, 12, 13 and 14 rejection over the Vollert patent in view of the Nakamura or Taglione patent and in view of the Kavehrad article, and in further view of the Vowell or Shibuya patent.

Claims 11, 12, 13 and 14 are dependent upon Claim 1. Thus, the Applicants respectfully refer the Examiner to the comments above regarding Claim 1. For the reasons given above, the Applicants submit that Claim 1 is patentable over the cited prior art. Therefore, the Applicants submit that these Claims 11, 12, 13 and 14 are patentable over the cited prior art at least through their dependence upon an allowable base claim.

Furthermore, as previously stated and repeated here for clarity, the Applicants respectfully note that trying to combine the Vollert patent with the Kavehrad article would change the principle of operation of the Vollert patent. Thus, it would not have been apparent to any one skilled in the art to use the prior arts in this manner, since the

combination of the prior art references would render the Vollert patent unsatisfactory for its intended purpose.

For the foregoing reasons the Applicants respectfully request that these rejections of Claims 11, 12, 13 and 14 under 35 USC §103(a) be withdrawn.

35 USC§ 103(a)

The Examiner rejected Claim 17 under 35 U.S.C. 103(a) as being unpatentable over Vollert (German Patent No: DE 44 33 896 CI), herein referred to as the "Vollert patent," in view of Nakamura (US Patent No: 6,583,908), herein referred to as the "Nakamura patent," or Taglione et al. (US Patent No: 5,966,225), herein referred to as the "Taglione patent," and in further view of Kavehrad (Canadian Electrical & Computer Engineering Journal, Vol. 16, No: 1, PP. 13-18), herein referred to as the "Kavahrad article," and in further view of Driessen (US Patent No: 5,936,578), herein referred to as the "Driessen patent."

Regarding Claim 17 rejection over the Vollert patent in view of the Nakamura or Taglione patent, and in view of the Kavehrad article, and in further view of the Driessen patent.

Claim 17 is dependent upon Claim 1. Thus, the Applicants respectfully refer the Examiner to the comments above regarding Claim 1. For the reasons given above, the Applicants submit that Claim 1 is patentable over the cited prior art. Therefore, the Applicants submit that Claim 17 is patentable over the cited prior art at least through its dependence upon an allowable base claim.

Furthermore, as previously stated and repeated here for clarity, the Applicants respectfully note that trying to combine the Vollert patent with the Kavehrad article would change the principle of operation of the Vollert patent. Thus it would not have been apparent to any one skilled in the art to use the prior arts in this manner, since the combination of the prior art references would render the Vollert patent unsatisfactory for its intended purpose.

For the foregoing reasons the Applicants respectfully requests that this rejection of Claim 17 under 35 USC §103(a) be withdrawn.

Claim 18

The same arguments presented above with reference to Claim 1 can be applied to Claim 18. Therefore, the Applicants submit that Claim 18 is patentable over the cited prior art.

Dependent Claims

Claims 2-17 are dependent upon Claim 1 and Claims 19-28 are dependent upon Claim 18. For the reasons given above, the Applicants submit that Claims 1 and 18 are patentable over the cited prior art. Therefore, the Applicants submit that Claims 2-17 and 19-28 are also patentable over the cited prior art at least based on their dependence upon an allowable base claim.

New Claims

New Claims 29-51 have been added. Support for new Claims 29-51 can be found in the currently pending claims and on pages 9-23 of the specification, and in FIGs. 1, 2, 3, 4 and 5. Applicants submit that these new claims are patentable over the cited prior art. Specifically the Applicants submit that the cited prior art does not teach, disclose or suggest "a controller configured to receive environmental information from the environment and data from the data source, wherein the controller is connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion, and wherein the portions of the data to be transmitted are adjusted by the controller based on the environmental information."